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EIGHTH REPORT

OF THE

PREPAREDNESS INVESTIGATING SUBCOMMITTEE

OF THE

COMMITTEE ON ARMED SERVICES

UNITED STATES SENATE

UNDER THE AUTHORITY OF

S. Res. 215

(84th Congress, 2d Session)

NAVY AIRCRAFT PROCUREMENT PROGRAM
FINAL REPORT ON
F3H DEVELOPMENT AND PROCUREMENT

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LETTER OF SUBMITTAL

UNITED STATES SENATE,
PREPAREDNESS INVESTIGATING SUBCOMMITTEE,
April 23, 1956.

Hon. RICHARD B. RUSSELL,
Chairman, Committee on Armed Services,
United States Senate.

MY DEAR MR. CHAIRMAN: There is submitted herewith the eighth report of the Preparedness Investigating Subcommittee, created by action of the committee under Senate Resolution 215, 84th Congress.

This report is the second and final report of investigation involving the Navy's procurement of the Demon fighter, a general-purpose jet warplane.

In an initial report the subcommittee concluded that the Navy had spent in excess of $300 million in the development and procurement of the F3H fighter and the J40 Westinghouse jet engines which were initially designed to power the plane, and had yet to receive a single plane that could be certified for delivery to the fleet. At that time, however, the Navy reported that one of the most recent models (powered with a J71 Allison engine) would be delivered in January 1956. At the present writing we have been advised that delivery of the first six aircraft to the fleet was effected in the first week of March.

Except for the lessons learned, the money spent on the F3H, powered with the Westinghouse engine, is a total loss. The money was expended in the pursuit of an accelerated program that departed from normal procurement procedures under the urgency of Korea in an unsuccessful gamble for time, the engine required (J40–10) never being delivered.

The subcommittee concludes that the Navy may not defend its decision to institute an accelerated program on the ground of wartime emergency and at the same time blame poor procurement practice for the failure of the program, as simultaneously it has done. The subcommittee proposes that the Navy and the Air Force submit a report on present procurement practice as early as this is deemed feasible. In addition a report is requested on the procurement of the Allison-powered plane (F3H2) at the time of its delivery to the fleet.

Numerous other inquiries and investigations are being conducted by the subcommittee, the results of which will be transmitted to you as rapidly as they are completed.

Respectfully,

LYNDON B. JOHNSON,
Chairman, Preparedness Investigating Subcommittee.

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FINAL REPORT ON F3H DEVELOPMENT AND PROCUREMENT

INTRODUCTION

In this report we record the disconcerting story of the ill-fated procurement by the Navy of a general-purpose jet fighter to be known, ironically enough, as the Demon fighter.

This was an airplane designed by the McDonnell Aircraft Corp. to be powered by a Westinghouse engine of materially greater thrust than had ever been used before. Korea brought the need for the plane and with it an assembly line gamble in which orthodox production methods were discarded. The engine needed for the job was never produced by Westinghouse and, while the struggle to devise and produce it ensued, 60 airframes were manufactured which will never be used in battle and are almost a complete waste. The result has been an overall loss of several hundreds of millions of dollars. It was not until the first week in March 1956 that the desired aircraft powered with Allison J–71 engines were finally delivered to the fleet.

Pursuant to its function as guardian of the taxpayers' interest, this subcommittee launched an investigation of the procurement in question and thereafter published an initial report in which questions were raised as to the causes of the wasted expenditure and the errors in the procurement program. Herein is an attempt to answer those questions. Further, we examine the procurement practices adopted in consequence of the failure of this and other aircraft programs.

BACKGROUND

This is the final report of the Preparedness Investigating Subcommittee on the Navy's procurement of the F3H Demon fighter (a general-purpose jet warplane). This report supplements a preliminary report submitted to the chairman of the Committee on Armed Services under date of November 4, 1955.

Herein we note the questions raised in the preliminary report, record the Navy's defense of its unsuccessful procurement program, and assess the reasons for failure. Without comment on the implications therein, and for what it is worth under all circumstances, one fact stands out significantly: a procurement operation born in 1951 during the Korean conflict and seeking to fill the need for an all-weather, all-purpose fighter plane, was not crystallized in the delivery of that plane until the first week in March 1956. That such delivery was effected is relied upon as the capping of a successful procurement effort.

Thus a program begun in 1947, and accelerated under the demands of the Korean incident to achieve a desired result, was still short of the mark nearly 3 years after the close of hostilities. That such delivery has been effected is relied upon by the Navy people at the operating level as indicating the success of the effort. Navy officials at higher echelons have blamed poor procurement procedures for the delay and the huge cost of the program.

The format of this report is cast into a recital of the conclusions in our earlier report, background, the facts as they have been amplified, and our conclusions and recommendation thereon.

Earlier conclusions were as follows:

(1) That in excess of $300 million had already been spent in the development and production of the Demon fighter.

(2) That the first 60 planes (some with engines fitted therein) would never perform their intended mission.

(3) That 107 Westinghouse engines (J40–22) were unsuitable for their intended mission.

(4) That at least 12 serious accidents and 18 abortive flights were due to malfunctions which had occurred in testing the F3H, with 4 lives lost.

(5) That the Westinghouse engine development program had a costly impact upon the procurement of at least three other airplane models.

(6) That the latest plane, the F3H–2 (fitted with a J71 Allison engine) had yet to fully prove itself qualified in the combat mission.

In an aircraft program, normally it is the engine which comes first, for it is the capability of the available engine which is the usual limiting factor in the performance to be realized from a new airplane design. This is the central fact in the understanding of the problems here, since the airframe was in production long before the desired engine was developed; although the earliest outlines of the Demon fighter as fleet airplanes were preceded by efforts to produce an adequate engine.

Thus, in 1947, the Bureau of Aeronautics originated a design competition for a new engine, the first versions to deliver about 6,000 to 7,500 pounds of thrust with augmentation (afterburning).

The competition was won by Westinghouse, its record in previous jet-engine programs being a factor.

When Westinghouse received a go-ahead in June 1947, the largest jet turbine engine available was about 4,000 pounds' thrust. The contract with Westinghouse called for the design and development of the engine—J40 series—beginning with the J40–6, having a completion date of December 1949.

In December 1948, Westinghouse had gained sufficient developmental experience with the engine to enable them to offer firm specifications on the future development of their product. They promised the delivery of one version of the engine, termed the —8, in approximately 20 months and an advanced version of higher thrust, the —10, in approximately 30 months. Contracts for these future developments were awarded in October and November 1948.

On January 3, 1949, a contract was awarded to the McDonnell Aircraft Co. for the type of plane desired at the time, a jet-powered (carrier-based) interceptor-type plane. The awarding of this contract was preceded by a competition within the aircraft industry for an airplane of limited fuel and combat radius with emphasis placed on very high performance for short periods of flight. The winner of this competition, the McDonnell Co., had previously been successful in the production of jet fighters. The McDonnell Co. produced our first

carrier-based jet fighter (the FH–1 Phantom) and was currently producing the F2H–1 Banshee, a fighter; both of these used Westinghouse engines.

DEMAND OF KOREAN CAMPAIGN

The Korean conflict started in June 1950 and the Russian Mig fighter had made its appearance in the Korea action. The Navy then made a reexamination of its fighter program. The examination indicated that the XF10F general-purpose fighter was in serious developmental trouble. According to the Navy this plane did not show sufficient promise.

At the same time the Navy had under development, along with the XF3H interceptor, the XF4D, which was also to be an interceptor. Both of these planes were showing excellent development and promise. An analysis by the Navy showed that the XF4D had a slight edge over the XF3H as an extreme performance interceptor. The aerodynamics development of the XF3H, however, had progressed to show that there was great growth potential in the airframe. Studies also showed that by using an engine of greater thrust (namely the J40–10 engine) the weight of the XF3H might be expanded from approximately 19,000 pounds to more than 29,000 pounds.

A review of the J40 engine status at this time showed that there had been some slippage in the overall schedule but the development was still reasonably satisfactory. In addition to engineering studies, the Navy conducted a very intensive wind tunnel model program for the airframe. The results of this program led the Navy to conclude that the expanded XF3H would become an excellent all-weather general purpose fighter compatible with Navy carriers.[1]

Therefore, in January of 1951, the Navy decided to modify the design of the XF3H (interceptor) and develop the heavier general-purpose fighter. A letter contract was thereupon awarded to McDonnell in March 1951 for 150 aircraft. When the letter contract was awarded to McDonnell to convert the XF–3H into the larger F3H, the development progress schedule on the J40–10 engine (9,000-pound class) indicated that it would be ready for use in April of 1952, about 1 year prior to the scheduled delivery of the first production F3H airframe.

According to the president of McDonnell Corp., production of this plane would also require an almost complete redesign of the experimental interceptor model and the end result would be a substantially heavier plane, reaching the weight of 29,000 pounds. This would be the airframe into which the J40–10 engine would be fitted.

By the middle of 1951, it became apparent that there would be major delays in the development of the J40–10. Surveys were conducted to determine whether other engines might be used. The Navy investigated the possible use of the Pratt & Whitney J57 engine and the Allison J71. However, the development of these engines had been started only in 1949 and at this time were no surer bets than the J40.

No action was taken by the Navy at this time for procurement of the J57 or J71 engines. There were two reasons assigned for this:

(1) The Air Force had heavy commitments for these engines;

[1] The first interceptor, XF3H, produced by McDonnell was flown in August 1951. Only 2 of these planes were built.

(2) The aircraft fuselage would have to be radically redesigned because the size of the engines differed from the J40–10.

By October 1951, it became apparent to the Navy that Westinghouse would not be able to develop the 9,000-pound thrust engine in time to meet the production schedule of the McDonnell fighter and the question of how to proceed was now urgent.

DECISION TO USE INTERIM ENGINE

A performance study was made of the production of the F3H general-purpose airplane utilizing a lower thrust engine than the one originally contemplated. According to the Navy, the result showed that, while not getting the desired goal to be obtained with the J40–10, the airplane would still have a decided margin of performance over the Mig and would be usable as satisfactory on an interim basis. The Navy, therefore, ordered a production version of the J40–8 engine with a J40–10 gearbox, the engine known as the J40–22 engine.

By utilizing these engines, which were in the 7,000-pound thrust class, the Navy states its belief that it would receive a usable tactical airplane besides being able to complete a test program for the plane. Consequently, the J40–22 engine was ordered in production quantities in September 1951.

The design engineering for this F3H–1 (Demon fighter) lagged, and it was not completed until October 1952, although the first plane was scheduled to come off the production line in January 1953. The first plane to actually come off the line did so in November of 1953 and was first flown in December.

In the meantime, Westinghouse advised the Navy in January 1952 that they could not meet the promised specifications on the J40–10 but would provide an engine in a power class greater than that of the J40–22 which would approximate the promised J40–10 performance. Subsequently, it intended to develop this interim (J40–24) engine and work it up to meet proposed J40–10 performance specifications.

A second study for interim engines was thereupon made. The J57 and J71 were now running and showed promise. In September 1952 the Navy was advised by Allison that the Air Force had canceled most of their requirements for J71 engines and that it had necessary engineering personnel to reconfigure the J71 engine to fit the F3H. The development program for the Westinghouse J40–10 engine was still lagging. Therefore, in December 1952, the Navy gave Allison the go-ahead sign to produce the J71 engine for the F3H. Although the engine had been recommended by McDonnell back in April 1952, authorization for engineering the changes in the airframe for the J71 was not given until April 1953. At this time Westinghouse was still in the picture, however.

By the summer of 1953, there was further slippage in the Westinghouse schedule. Also there was no assurance that the J40–10 would be forthcoming in any reasonable time. In July 1953, plans for utilization of the J40–10 engine were dropped and McDonnell was directed to commence incorporation of the J71 engine at the earliest practicable point. The F3H with the J71 engine was named the F3H–2.

The J71 engine was scheduled for delivery in June 1954. It was delivered in October 1954.

When McDonnell received the go-ahead sign, it informed the Navy that the new engine could not feasibly be incorporated in any airframe earlier than the 61st. The Navy therefore continued production of the Westinghouse J40–22 engines in anticipation of fitting them into the first 30 airframes. Although at this time it was hoped that J71 engines would be back-fitted into the second 30 planes on the production line, the hope was abandoned under date of December 5, 1955.

WESTINGHOUSE CANCELED OUT

In September 1953, all Westinghouse development contracts for the J40–10 engines were canceled by the Navy. At the same time production for the J40–22 engine continued under contract to reach a maximum of 107 engines to be completed by September 1955. In November 1953, the interim J40–22 engine was placed in the F3H–1 fighter on the production line. As noted, the production of the J40–10 engine had been canceled in September 1953, following continued proof that it would not be ready within any reasonable time, if at all.

Certain facts are here to be specially noted. Those are the facts respecting the production contracts. The first fact is that only 2 months before the contracts were canceled for the J40–10 engine, the production contract with McDonnell for the planes was increased to 528, an order for 160 planes being transferred from Temco.[2] Furthermore, it was determined, when the order for an increase was given, that a major redesign of the wing was required and should be installed at the point of engine change in the 61st plane. In June 1953, however, the production schedule was extended.

It should be noted that as early as April 1951 the McDonnell Corp. reported engine troubles had been encountered in the J40 engine series. By the time the F3H–1 was first flown (December 1953), McDonnell had repeatedly reported extensive engine troubles encountered by it. In December of 1953, after cancellation of the contract, however, the Navy approached Westinghouse in order to determine whether or not Westinghouse could begin again development work on the J40–10. It also requested from Westinghouse a time schedule as to possible development. The reason for approaching Westinghouse was due to the fact that Allison was encountering trouble and would be delayed in developing the J71 for the Navy. Westinghouse informed the Navy that it would take 2 years. The Navy thereupon decided to go along with Allison with the hope that the Allison engines could be produced in time to be fitted into the 61st airplane.

The month of December 1953 appears to have been a crucial one in the history of the development of the Demon fighter airplane. At this time the Navy had canceled out the J40–10 development program; Allison was in trouble over the development of the J71 and there was no foreseeable engine which could be used in the F3H airplane to meet the maximum performance necessary; McDonnell had produced

[2] In our initial report we noted that the contract with McDonnell had been increased to 528, coupling this with the observation that this had been effected "even though at this time there was apparently little cause for believing that an adequately powered engine would ever be available." Without the addition of the fact that the contract for 160 planes had been transferred from Temco and that the overall contracture remained at 528 planes, our original statement would of course have misleading possibilities. Prior to the issuance of reports by this subcommittee, the interested services are afforded an opportunity to meet with members of the staff and to correct any errors that may appear. On November 1, 1955, Navy representatives met with the subcommittee staff and, after review of the final draft, made certain suggestions for correction. There was, however, no criticism of the statement in issue on the part of the Navy at that or any other time.

1 F3H airplane, and the major components of approximately 30 airplanes had already been assembled at this time. It appears, however, that a stretch-out of the program had been ordered in November 1953. This was the sixth stretch-out during the year.

In early 1954, the J40–22-powered F3H–1 had proved by flight tests, according to the Navy, to have the performance expected, although it did not have the expected extreme performance of the J71-powered F3H–2. However, following a number of accidents the Navy indicated that the J40–22 was mechanically unreliable for service use, and flight operations were finally suspended in July 1955.

On June 21, 1954, the Navy issued a memorandum on the Demon fighter program. It was concluded that the J40 engine would never be a completely acceptable service engine. In addition, the poor maneuverability of the aircraft at high altitudes was noted as an unsolved problem. Accordingly, the F3H–1 model was to be limited to a one-service tour with no overhauls to be performed. Spare parts support was cut back, and the overall effect of the memorandum was the final abandonment of all hope to make the F3H–1, which represented the first 60 planes produced by McDonnell, a first-line flight-service aircraft.

SUMMARY OF F3H ACCIDENTS

Since the publication of the interim report, the Navy has supplied an authoritative summary of the accident record of the F3H.

The summary, according to the Navy, is a compilation agreed upon by the principals involved—the Navy, Westinghouse, and McDonnell.

There were 12 major accidents during test flights, resulting in the loss or damage to the aircraft and the death of 4 pilots (1 Navy, 3 McDonnell).

Of these 12 accidents, 3 could be classified as resulting from engine malfunction; 3 could be classified as the result of airframe difficulties; and the remainder could be classified as the result of either pilot error or a combination of airframe and engine trouble.

The first accident occurred on August 2, 1952, when there was an engine-turbine failure in the interceptor model. The plane required major overhaul.

Accidents occurred in March 9, 16, and 18, 1954. In the March 9 accident, an XF3H interceptor, experimental model, exploded and disintegrated in midair. The pilot parachuted to safety.

On March 16, an F3H–1 fighter, production model, lost power in flight and the pilot made a dead-stick landing. The aircraft was damaged substantially but was repairable.

On March 18, an F3H fighter, production model, while undergoing a Navy preliminary evaluation flight, suffered engine failure. Shortly thereafter the tail assembly separated from the aircraft and the Navy test pilot parachuted to safety. The plane was a total loss.

Immediately after this last accident the fighter was grounded. Flying was not resumed until June 30, 1954.

The first fatality occurred on February 23, 1955, when a McDonnell test pilot was killed in the F3H–1N fighter that was converted into an F3H–2N J71 (Allison engine) powered prototype. The pilot was performing a supersonic speed test at high altitude. The cause of the accident has never been firmly established.

The second fatal accident occurred on April 19, 1955, when a Navy test pilot was killed in an F3H–1 fighter during deliberately flamed-out (dead-stick) landing tests. An inadequate emergency-powered control system was held responsible.

On May 18, 1955, a McDonnell test pilot was killed in an F3H–1N fighter. The engine stalled during flight at 30,000 feet. A malfunction in the ejection seat prevented the pilot from parachuting to safety.

On July 7, 1955, a McDonnell test pilot was killed in an F3H–1N fighter attempting takeoff. For an undetermined reason, the pilot did not use the J–40 afterburner and the engine did not have sufficient thrust to complete the takeoff.

Further information concerning all accidents may be found in exhibit 1.

NAVY PLANS FOR THE F3H–1 AIRPLANES AND J–40 ENGINES

Sixty planes were produced under the F3H–1 program. Accidents caused the destruction of eight planes. Fourteen planes are complete with engines: 3 with J71 Allison engines and 11 with Westinghouse J40–22A interim engines. There are 38 airframes which have no engines installed. The Navy does not contemplate using any of the F3H–1 planes for any of its operational flying, with the exception of three which have Allison engines installed.

In the interim report the subcommittee noted that the Navy had a program for using 15 planes. These were to be used for the following purposes: Ground instruction of maintenance personnel, barricade and catapult tests, gun and missile vulnerability tests, and ground instruction of personnel and maintenance.

Subsequent to the issuance of this report, the Navy reported that it was contemplating back-fitting the J71 engine into the second 30 airplanes. On December 30, 1955, as a result of another check to verify this fact, the subcommittee was informed by the Navy that the decision not to back-fit the J71 engine into any of the 60 planes was made on December 5, 1955. The 38 planes will never be flown but will be used (without engines) as noted above.

There were 107 Westinghouse engines produced in the J40–22 interim program. The 11 engines already installed in the F3H–1 will remain with the aircraft and the entire assembly will be designated for noncombat use. The Navy has elected not to test 20 engines which will remain nonoperable. The Bureau of Ships has been assigned 12 engines to operate a special project. The United States Air Force will receive 12 engines for use in a research and development program. A number of engines have been destroyed through accidents and during tests. The remaining engines are to be assigned to the Naval Air Command in Memphis, Tenn., for ground instructional training and for disposal as excess material. Spare parts for engines which have been delivered to McDonnell Corp., are to be disposed of by the company.

THE LESSONS LEARNED

Starting with the decision to hire McDonnell and Westinghouse, the Navy has been completely cooperative in explaining its decisions step by step. Subcommittee staff members in conference with Navy

officials were advised that if the latter had to do it all over again, the same decisions would be made. Another Congressional committee has been told that the Navy might eventually get its money out of the Demon fighter program and this in spite of the cancellation of Westinghouse contracts and other manufacturers' contracts.

In assessing responsibility for the delay (although not for the failure of the program, which failure is not admitted) the Navy points to Westinghouse's failure. The net result is the avowal that a program shot through with failure and delay is now termed successful because of the recent delivery of the F3H2, powered with the Allison engine.

The subcommittee is primarily interested not in what has been said, but what has been and what is being done to correct the situation. First, we must know what has been learned. The Navy advises that one lesson learned is that its optimistic expectations of 8 years ago as to the time required to design, build, and qualify a turbine engine have now been revised. The engine requires 5, not 3 years to develop. As a result, the Navy considers that engine programs must be initiated at a considerable time in advance of their intended airframes and that definite milestones of engine development achievement must be attained prior to release of an airframe committed to that particular power package.

Another asserted lesson learned is that while a modern turbine engine is reasonably susceptible to theoretical analysis and design, the real proof of the product comes in actual testing.

A third asserted lesson learned is that better sales resistance to backlog-minded manufacturers is necessary. J. H. Smith, Jr., the Assistant Secretary of the Navy for Air, has made the following observation as to these manufacturers in a speech, a copy of which has been forwarded to this subcommittee in connection with the present inquiry:

> These beautiful designs [engine designs] they sell hard and convincingly. In the pervading atmosphere of optimism about the future it is difficult for the Government people to keep level heads to prevent setting up the very kind of situation which we have had in the past. It is something like the technique where the constant repetition of an impossibly optimistic plan becomes harder and harder to refute. It seems as though both the engine and aircraft contractors were content with the short range view that a big contract in hand on which delivery is shaky is better than the chance of a really sound program at a later date. In plainer words let's get a big contract backlog now and tackle the production problem later.

In June 1954, the Navy revised its procurement policy promulgating a plan designed "FIRM" (fleet introduction of replacement models), dubbed the "try before you buy program." In brief, the plan contemplated the production and testing of a limited number of experimental planes before scheduling them for large production orders. It has been declared by the Navy to be a plan for peacetime which could be accelerated in wartime. The plan as outlined by Secretary Thomas of the Navy to the Special Investigating Subcommittee of the House Armed Services Committee on February 4, 1955, is as follows:

> (1) A low rate of production of the new planes in the first 3 years with all production planes going immediately into the test program. Fleet delivery of planes is withheld until the entire test run on a new model has been completed and changes have been made on the production line. Thus when planes are delivered to operational squadrons, they will be as nearly combat ready as possible and will require no major "fixes" in the field.
>
> (2) A program in which various types of complex equipment will be produced on a "pilot line" production basis before they are selected for a specific aircraft

installation. Attention is also being given to the matter of alternate or "backup" installations so that when serious developmental problems are encountered, a comparable item can be substituted without seriously retarding airplane schedules.

(3) The airframe manufacturer is being given increased responsibility for system coordination to integrate and correlate the various related components, furnished either by the Government or the contractor, into a completely coordinated system.

(4) Increased stress is being placed upon designing the initial article for quantity production and producing the early aircraft on tooling designed for production of higher quantities when and if the development of the model warrants such action. Although this makes the initial phase of the program more costly, it is, in the long run, more economical.

As we have stated, the FIRM plan is a plan for peacetime. It would be accelerated in case of war. The Navy asserts that if another "Korea" should occur tomorrow, a very different policy in aircraft procurement would be followed from that of 1950.

This policy would be—

First, to accelerate production rates of proven models now coming off the production lines and keep those models in high-volume production until replacements of high-performance models are phased into the production;

Second, to accelerate tests and evaluation of improved models now flying so that they could be placed in volume production at the earliest practicable moment;

Third, to increase the tempo of development of new, very high performance types.

FINDINGS AS TO PAST AND PRESENT PROCUREMENT

The FIRM plan has not yet had the chance to prove itself in its various phases. Basically it is a plan for peacetime and it perhaps would have had some worth in meeting difficulties and errors in the post-Korean Demon fighter aircraft procurement. The wartime efficacy of this or any other procurement plan is, of course, something else again. What would be the success of FIRM when stepped up under wartime demands is a matter not for forecasters but for historians.

In the Korean campaign the Air Force gambled successfully with the F86, the gamble resulting in volume production of a technically advanced aircraft type and the Air Force emerged successfully with a high-speed fighter in sufficient quantity that had marked success in Korea.[3]

We do not cite this as a comparison in order to embarrass the Navy but, on the other hand, as exploring the possibility that adherence to the FIRM or any other plan in case of war might result in the disaffirmance of the imaginative thinking that had proved successful in the case of the accelerated Air Force program.

This brings us inevitably to the question of the calculated risk decision. The decision to go ahead with airframes before an engine had been devised was made under the stress of the Korean exigency. That it did not work out was unfortunate but the Navy may not validly be criticized for the decision, in our opinion. On the other hand, we do not think any blame for the failure of the program may be laid at the door of earlier procurement practice. What has somehow been overlooked is that the essential procurement practice employed

[3] The Air Force made a successful production line conversion of a fighter plane into a fighter-bomber.

with respect to the Demon fighter would inevitably result in some wastage of airframes if the engine were not forthcoming.

This was the heart of the risk. If FIRM were in effect in 1951 the end result obviously could have been no different since airplanes require engines under FIRM as well as under any other plan. Translating FIRM into wartime conditions by compressing the time factor might conceivably have resulted in less cost but the possible advantage of successful speculation would have been foregone.

As to the cost, the Navy insists that as late as June 1953 there was a real possibility that the J40–10 engine would materialize and we note that even before the decision was made to abandon the J40–10 there had been three stretch-outs during 1953.

On the informed basis of hindsight, it would be easy to render a judgment that the program had not been sufficiently extended. We conclude that respect for our standards of fairness would not be improved were we to indulge such an advantage.

However, withholding of criticism of the decision to embark on a daring procurement program for the F3H–1 plane does not mean, of course, that such program was successful; nor can any success with the Allison-powered F3H–2 change the facts as to the predecessor, F3H–1. Whether or not, as contended by the Navy, the plane using the interim engine would have had a decided margin on the Mig is speculation as to which it seems pointless to join. Even granting that the performance was of the quality claimed by the Navy, the continuing unreliability of the interim engine seems to have foreclosed any possibility of its use in battle.

Apropos of the bankrupt F3H–1 program was its sad epilogue enacted recently in the streets of St. Louis, Mo., when 21 of the planes were towed to barges for delivery to the Navy.

At the briefing session on November 1, 1955, the Navy did not object to our statement that over $300 million had been spent on the program, this figure including the Allison-powered planes. The Navy did register an objection to our statement as to the $300 million cost for the interceptors and the first 60 fighters but did not attempt to amplify its previous cost submissions. Since then, on specific request from us, we have been furnished with a detailed statement of costs for the planes in question. We are advised that costs directly incurred by the program totaled $265,579,500, and that facilities used in the development of the engines cost $112,581,000. These facilities were used prior and subsequent to the J40 program for the manufacture of other jet engines. The cost is summarized as follows:

XF3H	$12, 088, 000
Airframes, equipment, and support	107, 038, 000
Engines	107, 000, 000
Other programs which used J40 engines	39, 433, 000
Barging (F3H)	20, 500
Total	265, 579, 500

CONCLUSIONS

Our further investigation confirms all of the conclusions summarized in our earlier report and repeated above. These conclusions, therefore, are confirmed. We conclude further as follows:

1. The failure of the F3H–1 program may not successfully be laid at the door of earlier procurement practices.
2. The quality of the new procurement procedures has not yet been established.
3. The delivery to the fleet of the first group of F3H–2 planes was effected after numerous delays, the last of which postponed delivery for the contemplated date of January 1956.

RECOMMENDATIONS

The national interest in effective procurement practices in the military services requires no reiteration and it is the function of this subcommittee to maintain constant vigilance in vindicating that interest. To this end, it is recommended:

1. That the Secretary of the Navy periodically report to this subcommittee on the progress and results of the present aircraft procurement procedure at the earliest time deemed feasible.
2. That the Secretary of the Air Force prepare a report on a so-called low rate of aircraft-production plan, a plan similar to FIRM.
3. That the Secretary of the Navy report to the subcommittee the pertinent facts (including costs) relating to the F3H–2 Demon fighter procurement.

APPENDIX

EXHIBIT 1

Accident record of the F3H

Model	Bureau number	Date and time	Location	Purpose	Weather	Injuries [1] (pilot)	Damage [2]	Remarks
XF3H-1	125444	Aug. 2, 1952	Pratt, Kans.	Test	O. K.	E	B	Thrown bucket, power loss; short landing; Pilot P. W. Houghton.
XF3H-1	125444	0930, Mar. 9, 1954	St. Louis	do	O. K.	C	A	In flight explosion.
F3H-1N	133489	1205, Mar. 16, 1954	do	do	O. K.	E	C	Tossed bucket-oil line failure; bearing seizure.
F3H-1N	133490	Mar. 18, 1954	do	do	O. K.	C	A	Fire; loss of control; tail pulled off.
F3H-1N	133491	Nov. 1, 1954	Pax River	Taxi engagements	O. K.	D	A	Taxi engagements: Morest gear failed.
F3H-1N	133501	Jan. 20, 1955	do	CV landings	O. K.	E	D	Nose gear failed on inflight gear engagement.
F3H-2N	133520	Feb. 23, 1955	St. Louis	Test hi-mach	O. K.	A	A	J. E. Todnem killed; doing Mach 1.12 stick taps.
F3H-1N	133499	Apr. 19, 1955	Pax River	BIS trial	O. K.	A	A	Comdr. K. D. Smith killed; power control loss in dead-stick landing.
F3H-1N	133495	May 18, 1955	St. Louis	Radar test	O. K.	A	A	Robert Strange killed; J40 compressor stall; seat malfunction.
F3H-1N	133494	July 7, 1955	do	Autopilot test	O. K.	A	A	Albert Seawell killed; takeoff nonairbase takeoff.
F3H-2N	133558	Oct. 6, 1955	Pax River	BIS trials	Night visual	D	A	Level formation flight collision; Lieutenant Shaeffer.
F3H-2N	133549	do	St. Louis	MAC test	O. K.	D	A	Inverted-spin demonstration pilot ejected; Geo. Mills.

[1] Explanation:
Class A, pilot injury is fatal.
Class B, critical injury.
Class C, pilot injury is serious.
Class D, pilot injury is minor.
Class E, pilot is not hurt.

[2] Explanation:
Class A, damage is loss of the aircraft.
Class B, substantial major overhaul.
Class C, substantial major overhaul not required.
Class D, damage is minor damage.